

**Listing of Claims.**

Please amend the claims as shown below by deleting the material indicated by strike-through and adding the underlined material. This listing of claims will replace all prior versions and listings of the claims in this application.

1. (Original) An isolated polynucleotide encoding DsrA, the polynucleotide selected from the group consisting of:
  - (a) DNA having the nucleotide sequence of **SEQ ID NO:1**;
  - (b) DNA having the nucleotide sequence selected from the group consisting of **SEQ ID NO:3, SEQ ID NO:5, SEQ ID NO:7, SEQ ID NO:9, SEQ ID NO:11, SEQ ID NO:13, SEQ ID NO:15, and SEQ ID NO:17**;
  - (c) polynucleotides that hybridize to DNA of (a) or (b) above under stringent conditions and which encode DsrA; and
  - (d) polynucleotides that differ from the DNA of (a) or (b) or (c) above due to the degeneracy of the genetic code, and that encode DsrA encoded by a DNA of (a) or (b) above.
2. (Original) An isolated polynucleotide according to Claim1 that encodes DsrA.
3. (Original) An isolated polynucleotide that encodes DsrA, wherein the DsrA has the amino acid sequence given herein as **SEQ ID NO:2**.
4. (Original) An isolated polynucleotide that encodes DsrA, wherein the DsrA has and amino acid sequence selected from the group of **SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, SEQ ID NO:14, SEQ ID NO:16, and SEQ ID NO:18**.
5. (Original) An isolated polynucleotide according to Claim1 which is a DNA having the nucleotide sequence given herein as **SEQ ID NO:1**.

6. (Original) An isolated protein encoded by a polynucleotide according to Claim 1.
7. (Original) An isolated and purified protein having the amino acid sequence selected from the group consisting of **SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, SEQ ID NO:14, SEQ ID NO:16, and SEQ ID NO:18.**
8. (Original) An expression vector comprising a polynucleotide according to Claim 1.
9. (Original) A cell containing an expression vector according to Claim 8.
10. (Original) A cell containing an expression vector according to Claim 8 and capable of expressing DsrA.
11. (Original) An antibody that specifically binds to a protein encoded by a polynucleotide according to Claim 1.
12. (Original) An antibody according to Claim 11, wherein said antibody is a polyclonal antibody.
13. (Original) An antibody according to Claim 11, wherein said antibody is a monoclonal antibody.
14. (Original) An antisense oligonucleotide complementary to a polynucleotide of Claim 1 and having a length sufficient to hybridize thereto under physiological conditions.
15. (Original) A DNA encoding an antisense oligonucleotide of Claim 14.

16. (Original) An expression vector comprising an antisense oligonucleotide according to Claim 14.

17. (Original) A method for producing a protein comprising the amino acid sequence selected from the group consisting of **SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, SEQ ID NO:14, SEQ ID NO:16, and SEQ ID NO:18**, or a fragment thereof, comprising

(a) culturing a host cell containing an expression vector containing at least a fragment of a polynucleotide sequence encoding DsrA under conditions suitable for the expression of the protein; and

(b) recovering the protein from the host cell culture.

18. (Original) A method for detecting a polynucleotide which encodes DsrA in a biological sample comprising:

(a) hybridizing the complement of the polynucleotide sequence which encodes a polynucleotide selected from the group consisting of **SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5, SEQ ID NO:7, SEQ ID NO:9, SEQ ID NO:11, SEQ ID NO:13, SEQ ID NO:15, and SEQ ID NO:17** to nucleic acid material of a biological sample, thereby forming a hybridization complex; and

(b) detecting the hybridization complex, wherein the presence of the complex correlates with the presence of a polynucleotide encoding DsrA in the biological sample.

19. (Original) The mutant *H. ducreyi* strain FX517, wherein the mutant does not encode or express DsrA.

20. (Original) A vaccine composition comprising purified protein DsrA or a fragment thereof in a pharmaceutically acceptable carrier.

21. (Original) A vaccine composition of Claim 20 further comprising another outer membrane protein of *H. ducreyi*.

22. (Original) A vaccine according to Claim 20 further comprising an adjuvant
23. (Original) A vaccine composition comprising a polynucleotide of Claim 1 in a pharmaceutically acceptable carrier.
24. (Currently amended) A vaccine composition according to Claim 23 34 wherein the polynucleotide has the sequence SEQ ID NO:1.
25. (Original) A vaccine composition comprising an expression vector of Claim 8 in a pharmaceutically acceptable carrier.
26. (Original) A vaccine composition comprising the *H. ducreyi* mutant FX517 in a pharmaceutically acceptable carrier.
27. (Original) A DNA vaccine comprising an attenuated *H. ducreyi* strain.
28. (Previously presented) A method for inducing a protective immune response in a subject at risk of developing *H. ducreyi* infection comprising administering to the subject a vaccine according to Claim 24 in an amount sufficient to induce an immune response.